



219.40241X00/P12094

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant: Ajit V. SATHE

Serial No.: 09/893,466

Filed: 29 June 2001

Title: ARRANGEMENTS TO PROVIDE MECHANICAL STIFFENING
ELEMENTS TO THIN-CORE OR CORELESS SUBSTRATE

Art Unit: 2827

Examiner: Ishwarbhai B. PATEL

Conf. No: 5280

APPEAL BRIEF and FEE

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

19 August 2003

TECHNOLOGY CENTER 2800

AUG 20 2003

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Sir:

Appellant herein files an Appeal Brief (in triplicate) in accordance with the
provisions of 37 CFR 1.192(c), within a two (2) month period from the 19 June 2003,

09/24/2003 RGRAD 00000001 010135 00893466
filing date of the Notice of Appeal, and with the fee (code 1402/2402; may be under

01 FC:1402
02 FC:1251

320.00 DA
separate cover letter) required under 37 CFR 1.17(c) on filing a Brief in support of

the Appeal as follows:

The following items 1-9 are provided with the headings and the order required
by 37 CFR 1.192(c).

1. REAL PARTY IN INTEREST

A statement (as required by 37 CFR 1.192(c)(1)) identifying the real party in
interest, if the party named in the caption of the brief is not the real party in interest,

is given as follows: Intel Corp. is the real party in interest, by virtue of an Assignment of all rights in the subject matter of the present invention from the inventors, recorded in the USPTO on 19 April 2002 at real/frame 012816/0948.

2. RELATED APPEALS AND INTERFERENCES

A statement (as required by 37 CFR 1.192(c)(2)) identifying by number and filing date all other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal, is given as follows: There are no appeals or interferences.

3. STATUS OF CLAIMS

A statement (as required by 37 CFR 1.192(c)(3)) of the status of all the claims pending or cancelled, and identifying the claims appealed, is detailed as follows:

Claims 1-64 have been advanced during the prosecution history of the application.

Claims 1-13 and 40-45 were previously canceled without prejudice or disclaimer, and accordingly, claims 14-39 and 46-64 remain pending in the application.

Claims 19, 24-26, 32, 37-39, 50, 57 and 62-64 stand withdrawn from consideration.

Claims 53-64 stand rejected under 35 USC '112, second paragraph. Claims 14-18, 20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 stand rejected under 35 USC '103.

Ones of the claims have been twice rejected and/or have been given a final rejection, and accordingly, the jurisdictional prerequisite under 37 CFR 1.191 for appeal from the decision of the Examiner to the Board of Patent Appeals and Interferences has been met. In view of the requirements under 37 CFR 1.191 that an Appeal in an application or reexamination preceding must identify, when the appeal is taken, all rejected claim or claims which are to be appealed and proposed to be contested, Appellant respectfully submits that all presently rejected claims (including claims 14-39 and 46-64) are appealed.

4. STATUS OF AMENDMENTS

A statement (as required by 37 CFR 1.192(c)(4)) of the status of any amendments filed subsequent to Final Rejection, is detailed as follows:

Appellant's "Amendment" filed 19 March 2003 has been acted upon by the Examiner and treated in an "Advisory Action" dated 03 June 2003, with the following effect: The request for reconsideration has been considered by does not place the application in condition for allowance because of the reasons set forth within the continuation sheet attached to the Advisory Action. It is respectfully noted that the Advisory Action was incomplete/unclear in a number of ways.

Appellant's "Request For Corrected Advisory Action" dated 19 June 2003 has not yet been acted upon by the Examiner. Accordingly, the Advisory Action remains incomplete/unclear. For example, it remains unclear whether the claim amendments within Appellant's 19 March 2003 Amendment have been entered, and if so, whether such claim amendments obviated the 35 USC '112, second paragraph, rejection.

5. SUMMARY OF INVENTION

A concise explanation (as required by 37 CFR 1.192(c)(3)) of the invention defined in the claims involved in the appeal, which refers to the specification by page and line number, and to the drawing, if any, by reference characters, is detailed as follows:

Thin-core and/or coreless packaging arrangements are emerging (new) technologies being worked on heavily by the Assignee of the present application, and the terms "thin core" and "coreless" are directed to very specific (new) packaging technologies. Basically, Assignee is interested in the emerging "thin core" and "coreless" packaging technologies so as to be able to achieve/offer thinner semiconductor products allowing OEMs (original equipment manufacturers) to achieve/offer thinner consumer products (e.g., laptops, cell phones).

As an example and for teaching purposes, a copy of a 13 September 2002 publication authored by Kevin Teixeira of Intel Corporation, and titled "Bumpless Build-Up Layer Packaging Technology" was submitted appended to Appellant's 03 October 2002 Amendment. The diagram on page 2 of such publication illustrates

a standard cored arrangement, whereas the diagram on page 3 illustrates a coreless (or thin-core) arrangement. Within Appellant's present disclosure, FIG. 5 represents a standard cored arrangement, whereas FIGS. 6 and 7 represent "stiffened" thin-core and coreless arrangements, respectively.

Appellant's specification page 6, line 20, describes a thick (normal) substrate core as "0.7-0.8mm in thickness," and in contrast, Appellant's specification at page 8, line 11, describes a thin-core substrate core as "0.1-0.5, and more specifically, 0.4 mm" in thickness. Of course, a coreless substrate would not have a core substrate.

The FIG. 5 example thick core substrate arrangement is advantageous in that the thick core 512 affords a high degree of rigidity or stiffness to the substrate 110 such that, when an electronic component, e.g., flip-chip FC 120 is mounted and interconnected to the substrate 110 via high pressure and heat (i.e., a high temperature thermo-bonding process), the FIG. 5 arrangement experiences no, or a negligible amount of, bending and flexing. Accordingly, the FC 120 can be securely and reliably mounted and interconnected to the substrate 110. Appellants found, on the other hand, that the FIGS. 6 and 7 thin-core and coreless arrangements experience disadvantageous/destructive flexing (see Appellant's FIG. 8) when electronic components are mounted thereto. One result is low manufacturing yield.

Appellant's disclosed and claimed invention is directed to the combination invention which includes a thin-core or coreless packaging arrangement and additional support to minimize or prevent the disadvantageous/destructive flexing. That is, the present invention is directed to a thin-core or coreless integrated circuit

printed circuit board (IC-PCB) carrier package having a thin-core or coreless substrate together with a stiffener to provide stiffening support to the thin-core and coreless substrate. Appellant's FIG. 9 illustrates an example peripheral ring-like stiffener 990, while Appellant's FIGS. 12-15 illustrate other example stiffeners.

Further detailed discussions regarding Appellant's claimed invention can be found in Appellant's specification, beginning at line 9 of page 9.

6. ISSUES

A concise statement (as required by 37 CFR 1.192(c)(6)) of the issues presented for review, is detailed as follows:

- i. Whether claims 53-64 are unpatentable under 35 USC '112, second paragraph, as being vague, indefinite and/or ambiguous?
- ii. Whether claims 14-18, 20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 are unpatentable under 35 USC '103, as having been obvious from Lim et al. (U.S. Patent 6,020,221) further in view of Ho (U.S. Patent 6,287,890)?

7. GROUPING OF CLAIMS

It is understood (from 37 CFR 1.192(c)(7)) that, for each ground of rejection which appellant contests and which applies to a group of two or more claims, that

the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the arguments ahead, appellant explains why the claims of the group are believed to be separately patentable. It is further understood that merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

With regard to such requirement, Appellant respectfully submits that with respect to the 35 USC '103 rejection, claims 14-18, 20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 may (for the purposes of this Appeal only) may be treated during patentability analysis as standing or falling together as a group.

8. ARGUMENT

The contentions (as required by 37 CFR 1.192(8)) of the Appellant with respect to each of the issues presented for review in the foregoing Issues section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on, are provided as follows, with each issue being treated under a separate heading and having a sub-paragraph number corresponding to the sub-paragraph number in the preceding Issues section:

i. Claims 53-64 are patentable under 35 USC '112, second paragraph, and are not vague, indefinite and/or ambiguous.

For each rejection under 35 USC '112, second paragraph, Appellant's argument specifies (as required by 37 CFR 1.192(c)(6)(ii)) the errors in the rejection and how the claims particularly point out and distinctly claim the subject matter which application regards as the invention.

Claims 53-64 had been carefully reviewed and carefully amended where appropriate in Appellant's 19 March 2003 Amendment, in order to correct dependencies stemming from independent claim 52. Thus, Appellant's position is that all 35 USC '112, second paragraph concerns listed within the Office Action had been addressed.

However, as mentioned previously, the 03 June 2003 Advisory Action was incomplete/unclear, and Appellant's 19 June 2003 "Request For Corrected Advisory Action" dated has not yet been acted upon by the Examiner. Accordingly, it remains unclear whether the claim amendments within Appellant's 19 March 2003 Amendment have been entered, and if so, whether such claim amendments obviated the 35 USC '112, second paragraph, rejection.

It is respectfully requested that the standing 35 USC '112, second paragraph, rejection be reversed for the reasons given above.

ii . Claims 14-18, 20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 are patentable under 35 USC '103, and are not obvious from Lim et al. (U.S. Patent 6,020,221) further in view of Ho (U.S. Patent 6,287,890).

For each rejection under 35 USC '103 Appellant's argument specifies (as required by 37 CFR 1.192 (c)(6)(iv)) the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and explains how such limitations render the claimed subject matter unobvious over the prior art. Further, if the rejection is based upon a combination of references, Appellant's argument explains why the references, taken as a whole, do not suggest the claimed subject matter, and includes, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. Appellant acknowledges that (under the aforementioned 37 1.192 (c)(6)(iv)) a general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

As mentioned previously, Appellant's disclosed and claimed invention is directed to inventions concerning combination "thin-core" or "coreless" semiconductor packaging arrangements. The terms "thin-core" and "coreless" are directed to very specific (new) packaging technologies. Appellant's independent claim 14 (as well as all other claims) recites the feature/limitations of a package "having one of a thin-core and coreless substrate." Appellant's specification page 6, line 20, describes a thick (normal) substrate core as "0.7-0.8mm in thickness," and in

contrast, Appellant's specification at page 8, line 11, describes a thin-core substrate core as "0.1-0.5, and more specifically, 0.4 mm" in thickness. Of course, a coreless substrate would not have a core substrate.

Turning now to rebuttal of the applied references, Lim et al. appears directed to a standard cored arrangement, and nowhere does Lim et al. even mention "thin-core" or "coreless" substrate. The Examiner attempts to support the rejection by stating, "[t]hough, Lim does not disclose explicitly whether the substrate is coreless or thin core, Lim discloses that the substrate can be made of any known material including polyamide tape, column 5, lines 55-60, and the polyamide tape will be inherently a thin substrate." Traversal is appropriate because Lim at at's disclosure of polyamide tape includes no further disclosure as to exactly how thick such tape is.

It is respectfully submitted that tape can be manufactured to have an endless variety of thicknesses (even for a single product such as polyamide tape), and any attempt to characterize Lim et al.'s tape thickness is pure speculation. It is respectfully submitted that it cannot be assumed, for Lim at at's vague disclosure of "polyamide tape," that such tape is of a thickness matching that of a "thin-core" or "coreless" substrate. Again, there is no disclosure within Lim et al. as to what exactly constitutes a "thin-core" or "coreless" substrate. Accordingly, any "thin-core" or "coreless" interpretation would not be gained by Lim at at's disclosure itself, but instead would be gained by improperly applying hindsight knowledge from Appellant's present disclosure.

Turning next to rebuttal of the secondary Ho '890 reference, it is respectfully submitted that such reference is not relevant, in that Ho '890 contains a thick (normal) substrate core 14 (FIG. 1). More particularly, numerous locations within Ho '890 (e.g., column 4, lines 48-53; and column 6, lines 21-25) make it abundantly clear that substrate 14 of Ho '890 is an initial core upon which all other multi-layers are built. Related patent Ho '279 (U.S. Patent 6,242,279 Bi) which has overlapping drawings from Ho '890, makes it even more clear that Ho's substrate 14 is a core, as Ho '297's substrate 14 does not have windows etched all the way through the substrate 14, but instead has components 16 attached to the substrate 14.

Column 6, lines 56-58 of Ho '890 states that the substrate core 14 is "between about 30 to 40 mils thick," and converting this means the Ho '890 substrate core 14 is between 0.762mm and 1.016mm. Appellant's specification describes a thick (normal) substrate core as "0.7-0.8mm in thickness," and a thin-core substrate core as "0.1-0.5, and more specifically, 0.4 mm" in thickness. Accordingly, it can be seen that the substrate core 14 of Ho '890 represents a thick (normal) substrate core.

Advisory Action comments (see Continuation sheet attachment) next attempt to characterize Ho's "interconnect substrate 12" as "of the order of 10 to 50 micrometers", with such comments pointing to Ho's column 7, lines 21-34 and column 4, lines 44-56. Strong traversal is again appropriate. More particularly, Ho's interconnect substrate 12 is a multilayered structure, and the 10 to 50 micrometer disclosure only pertains to formation of the first epoxy layer of such multilayered

structure. It is respectfully noted that Ho's column 7, lines 35+, further teach that a "thin film interconnect metal layer 20 is formed on top of the layer of epoxy. Additional layers may be provided beyond the layer 20. To summarize, Ho nowhere teaches what the thickness of overall interconnect substrate 12 would be, i.e., the 10 to 50 micrometers is only an initial manufacturing thickness, to which further thickness is added, i.e., only one layer of multilayers. At best, Ho's FIG. 1 illustrates the interconnect substrate 12 as being close in thickness to the metal substrate 14, which, as mentioned above, is between 0.762mm and 1.016mm.

In concluding, given the fact that Lim at at appears to be directed to a thick (normal) substrate core, as it contains no disclosure concerning the "thin-core" or "coreless" technologies, and given the further fact that Ho '890 also is concerned with a thick substrate core, it is respectfully submitted that Lim at at and Ho '890, taken alone or in combination, would not have disclosed or suggested Appellant's "thin-core" or "coreless" combination invention.

As a result of all of the foregoing, it is respectfully submitted that the applied art (taken alone and in the Office Action combinations) would not support a §103 obviousness-type rejection of Appellant's claims. Since the combination of the cited references in the manner required to achieve the claimed invention would not have been obvious to one of ordinary skill in the art at the time the claimed invention was made, it is respectfully requested that the 35 USC '103 rejection of claim 14-18, 20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 be reversed.

GRATUITOUS ADVISORY ACTION COMMENTS - TRAVERSED

The Continuation sheet attachment to the Advisory Action makes additional gratuitous comments that other references of record have certain alleged thickness disclosures, but such comments are wholly unconnected/unrelated to any presently pending rejection/objection. Appellant and the undersigned categorically traverse such comments, and respectfully refrain from further unnecessary prosecution history estoppel comments regarding such gratuitous comments unless and until an actual rejection or objection including such references is made. In the absence of an explicit rejection/objection including such art, it is respectfully submitted that such gratuitous comments are irrelevant.

9. APPENDIX

For convenience of detachment without disturbing the integrity of a remainder of pages of this Appeal Brief, Appellant's "(7) APPENDIX" section (as required by 37 CFR 1.142(c)(9)) containing a copy of the claims involved in the appeal, is provided on separate appendix sheets following a signature portion of this Appeal Brief.

BREIF FILED IN TRIPLICATE

Three copies of this Brief are enclosed such that this Appeal Brief as required under 37 CFR 1.192(a).

8. APPENDIX

Note that the full text and/or status of all claims (including those not being appealed within this paper) may also be included to provide the convenience of a complete set of claims for easy review:

1-13. (Canceled without prejudice or disclaimer)

14. (Once Amended) A thin-core or coreless integrated circuit printed circuit board (IC-PCB) carrier package having one of a thin-core and careless substrate, and a stiffener to provide stiffening support to the one of a thin-core and coreless substrate.

15. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) and a flip chip ball grid array (FC-BGA) carrier package.

16. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, where the stiffener is substantially made of at least one of a metal, plastic, glass and ceramic material, is one of a molded, stamped, etched, extruded and deposited stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

17. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

18. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), and integrated heat spreader (IHS).

19. (Once Amended; withdrawn from consideration) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener being a multi-part stiffener.

20. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

21. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener having a top surface above a substrate-plane, which is substantially co-planar with, when mounted, a top surface of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader.

22. (Twice amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 21, the stiffener being disposable to co-support a heat sink, with one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

23. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, where if a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

24. (Once Amended; withdrawn from consideration) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the stiffener being an edge stiffener mounted to minor-planar side-surfaces of the substrate.

25. (Once Amended; withdrawn from consideration) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, the edge stiffener having a non-flat cross section which is mated with the side-surfaces of the substrate.

26. (Once Amended; withdrawn from consideration) A thin-core or coreless IC-PCB carrier package as claimed in claim 14, where the edge stiffener is pre-attached to the substrate by an IC-PCB carrier package manufacturer.

27. (Once Amended) A packaged integrated circuit (IC) comprising:
an IC, and a thin-core or coreless integrated circuit printed circuit board (IC-PCB) carrier package having one of a thin-core and coreless substrate, and a stiffener to provide stiffening support to the one of a thin-core and coreless substrate.

28. (Previously Presented) A packaged IC as claimed in claim 27, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) and a flip chip ball grid array (FC-BGA) carrier package.

29. (Amended) A packaged IC as claimed in claim 27, where the stiffener is substantially made of at least one of a metal, plastic, glass and ceramic material, is one of a molded, stamped, etched, extruded and deposited stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

30. (Previously Presented) A packaged IC as claimed in claim 27, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

31. (Previously Presented) A packaged IC as claimed in claim 27, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), and integrated heat spreader (IHS).

32. (Withdrawn from consideration) A packaged IC as claimed in claim 27, the stiffener being a multi-part stiffener.

33. (Previously Presented) A packaged IC as claimed in claim 27, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

34. (Previously Presented) A packaged IC as claimed in claim 27, the stiffener having a top surface above a substrate-plane, which is substantially coplanar with, when mounted, a top surface of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader.

35. (Once Amended) A packaged IC as claimed in claim 34, the stiffener being disposable to co-support a heat sink, with one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

36. (Previously presented) A packaged IC as claimed in claim 27, where if a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

37. (Withdrawn from consideration) A packaged IC as claimed in claim 27, the stiffener being an edge stiffener mounted to minor-planar side-surfaces of the substrate.

38. (Withdrawn from consideration) A packaged IC as claimed in claim 27, the edge stiffener having a non-flat cross section which is mated with the side-surfaces of the substrate.

39. (Withdrawn from consideration) A packaged IC as claimed in claim 27, where the edge stiffener is pre-attached to the substrate by an IC-PCB carrier package manufacturer.

40-45. (Canceled without prejudice or disclaimer)

46. (Previously Presented) A thin-core or coreless integrated circuit printed circuit board (IC-PCB) carrier package having one of a thin-core and coreless substrate, and a stiffener secured onto the at least one of a thin-core and coreless

substrate of the integrated circuit printed circuit board (IC-PCB) carrier package to provide stiffening support thereto.

47. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 46, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) and a flip chip ball grid array (FC-BGA) carrier package.

48. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 46, the stiffener is substantially made of at least one of a metal, plastic, glass and ceramic material, is one of a molded, stamped, etched, extruded and deposited stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

49. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 46, the stiffener being planar for mounting to a die-side major planar surface of the substrate.

50. (Once Amended; withdrawn from consideration) A thin-core or coreless IC-PCB carrier package as claimed in claim 46, the stiffener being a multi-part stiffener.

51. (Once Amended) A thin-core or coreless IC-PCB carrier package as claimed in claim 46, the stiffener being disposable to co-support a heat sink, with one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

52. (Previously presented) An electronic system comprising:
packaged integrated circuit (IC) having an IC, and a thin-core or coreless integrated circuit printed circuit board (IC-PCB) carrier package having one of a thin-core and coreless substrate, and a stiffener to provide stiffening support to the one of a thin-core and coreless substrate;
a receiving socket to receive the packaged IC; and
at least one input/output device.

53. (Once Amended) An electronic system as claimed in claim 52, the IC-PCB carrier package being one of a flip chip pin grid array (FC-PGA) and a flip chip ball grid array (FC-BGA) carrier package.

54. (Once Amended) An electronic system as claimed in claim 52, where the stiffener is substantially made of at least one of a metal, plastic, glass and ceramic material, is one of a molded, stamped, etched, extruded and deposited stiffener, and is capable of withstanding high temperatures of at least one of an IC die bonding operation and normal IC operation.

55. (Once Amended) An electronic system as claimed in claim 52, the stiffener being planar and mounted to a die-side major planar surface of the substrate.

56. (Once Amended) An electronic system as claimed in claim 52, the stiffener having an internal window therein to provide clearance for at least one of a die, under-fill, die side components (DSC), and integrated heat spreader (IHS).

57. (Once Amended; withdrawn from consideration) An electronic system as claimed in claim 52, the stiffener being a multi-part stiffener.

58. (Once Amended) An electronic system as claimed in claim 52, the stiffener having an above-substrate-plane height, which is less-than or equal to an above-substrate-plane height, when mounted, of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

59. (Once Amended) An electronic system as claimed in claim 52, the stiffener having a top surface above a substrate-plane, which is substantially coplanar with, when mounted, a top surface of one of: an IC-die, and a combination of an IC-die with an integrated heat spreader.

60. (Once Amended) An electronic system as claimed in claim 59, the stiffener being disposable to co-support a heat sink, with one of: an IC-die, and a combination of an IC-die with an integrated heat spreader (IHS).

61. (Once Amended) An electronic system as claimed in claim 52, where if a main body of the stiffener is electrically conductive, the stiffener further includes an insulator to electrically insulate electrical members on stiffener-opposing areas of the substrate.

62. (Once Amended; withdrawn from consideration) An electronic system as claimed in claim 52, the stiffener being an edge stiffener mounted to minor-planar side-surfaces of the substrate.

63. (Once Amended; withdrawn from consideration) An electronic system as claimed in claim 52, the edge stiffener having a non-flat cross section which is mated with the side-surfaces of the substrate.

64. (Once Amended; withdrawn from consideration) An electronic system as claimed in claim 52, where the edge stiffener is pre-attached to the substrate by an IC-PCB carrier package manufacturer.

DEPOSIT ACCOUNT AUTHORIZATION

To the extent necessary, Appellant petitions for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees and the fee for filing this Brief in support of the appeal, to Deposit Account No. 01-2135 (referencing case No. 219.40241X00) and please credit any excess fees to such deposit account.

DECISION RE ORAL HEARING DELAYED

Appellant will delay (as permitted by the provisions of 37 CFR 1.194) a final decision on oral argument until after review of the Examiner's Answer.

Respectfully submitted,



Paul J. Skwierawski
Registration No. 32,173

PJS/

Enclosures:

(2) copies of Appeal Brief
APPENDIX